

Information Disclosure Statement

An Information Disclosure Statement and accompanying PTO-1449 form were filed on April 23, 2001. There is presently no indication that the Examiner considered the documents identified in that Information Disclosure Statement. Accordingly, the Examiner is respectfully requested to acknowledge consideration of the documents identified in that Information Disclosure Statement by initialing the PTO-1449 form and returning a copy of the initialed form to the undersigned.

Drawings

Figures 1, 2 and 4 were objected to because of the informalities identified in the Office Action. The separately submitted Request for Approval of Drawing Changes dated October 30, 2001 addressed these objections. Accordingly, the Applicant respectfully requests the Examiner to acknowledge approval of the drawing changes. A copy of the Drawing Correction Authorization Request is enclosed for the Examiner's convenience.

35 U.S.C. § 102 & 103 Rejections

Claims 1-14 were rejected under 35 U.S.C. § 103 (a) as allegedly being unpatentable over Odaka (U.S. Patent No. 5,317,397) in view of Lee (U.S. Patent No. 5,592,226).

Reply to Response to Arguments

Since the Examiner has maintained the prior rejections and has provided arguments in support of this position, Applicant will address the Examiner's response first.

The Examiner alleges in his response on page 2 of the outstanding Office Action that Lee teaches measurement between frames as a whole. However, the Examiner has once again failed to address the specific teachings of Lee cited in Applicant's prior response. Specifically, Lee performs a comparison between the coding target frame f_c and the immediate past frame f_{c-1} or between the current frame f_c and the last reference frame f_{ref} . Once again Applicant respectfully submits that detection of the motion between the frames as a whole is not performed at all, in contrast to the present invention.

The Examiner apparently relies on the teaching of a Histogram of Difference (HOD) method discussed by Lee. Specifically, the Examiner relies on Fig. 29 and column 21, lines 53+ of Lee, quotes of these portions follows (with emphasis added):

In FIG. 29, a composite of three curves shows a comparison between the TAMI and OSA embodiments of the invention relative to image movement. The uppermost curve 120 shows a plot of image movement versus frame number for a GOP of 15 frames. In this example, the image movement curve 122 shows a region 124 of "busy temporal activity" between frames 1 and 7, and a region 126 of "low temporal activity" 126 between frames 8 and 15. As shown, in region 124 P frames occur more frequently or are closer to one another in this region because there is more data change, that is there is greater image movement from one frame to another. Contrariwise, in region 126 where image movement is substantially less, the P frames occur less frequently, or are further apart from one another, because there is less data change or image movement from one frame to another. In the curve section 128, TAMI processing for coding frames is shown as a plot of frame distance, that is the global

picture movement between frames relative to frame number. The frame distance or movement at which a **Type 0 threshold** is detected is shown by the broken line 130. As shown, each time the frame distance or image movement between frames exceeds the **Type 0 threshold** 130, the immediately previous frame from the occurrence of the **Type 0 threshold** is designated as a P2 frame. ...

Another embodiment of the invention designated BSE-TAMI (Binary Search Equidistant TAMI) will now be described. Assume N SSPs (scene segmentation points or **Type 0 scene changes**) are detected by the scene change detection algorithm 14 (see FIG. 4) using a constant threshold. Assume that the distance measure is an integer and, as a basis for developing a heuristic, is a monotonically increasing function with respect to the time separation between two frames. HOD (histogram of difference) is used in such a simulation to measure motion by distance measurements, because it generally tends to be monotonic.

The problem is to find nearly equidistant positions of SSPs or **Type 0 scene changes**. The present fast heuristic search is for positions that are close to the best positions. FIG. 30 is an example where two SSPs or Type 0 scene changes are detected by an SSP detector 14 using an initial threshold, $\tau_{sub.0}$, which produces N SSPs. Denote the distance between the last SSP and the end frame of a GOP by a (τ_{end}) .

As clearly indicated in the above sections relied upon by the Examiner, the HOD is merely one tool used to determine a scene change such as determined by the Type 0 threshold, which is consistent with Applicant's position and is in direct contrast to the Examiner's interpretation of this reference.

However, the Examiner need not rely on the Applicant's interpretation of the reference for the Lee reference itself expressly discloses what is meant by the Type 0 threshold and its relationship to the coding target frame f_c . The Type 0 threshold is a scene change threshold. This is clearly shown in Fig. 4 and described, for example, in column 10 lines 53 to column 11, line 11, which discloses the following (with emphasis added).

Two types of **scene detectors 12 and 14** are required for processing the algorithm, as shown. In FIG. 4, the first detector 12 declares a scene change of Type 1 for the current frame when the distance or relative movement measure between the current frame f_c and the immediate past frame f_{c-1} is above a threshold T_1 (step 103). This type of scene change corresponds to an actual scene content change; it is coded as an I2 frame (very coarsely quantized intra frame), and the immediate past frame f_{c-1} is coded in step 106 as a P2 frame (very coarsely quantized predicted frame). The I2 frame coding exploits the forward temporal masking effect, and the P2 frame coding takes advantage of the backward temporal masking effect.

The second detector 14 detects **scene changes of Type 0**. This implements a temporal segmentation algorithm for processing. This algorithm, as shown in FIG. 4, declares the current frame f_c as a **scene change of Type 0**, when the distance or relative movement measured between the current frame f_c and the last reference frame f_{ref} is above a threshold T_0 (see step 104). This time the immediate past frame f_{c-1} becomes a P1 frame which is a regular predicted frame. The bit allocation strategy for the temporal segmentation is that every end frame of temporal segments should become a P1 frame, and that the frames in between should be B1 or B2 frames depending on whether the extra P1 frame is being used or not.

As previously noted and expressly described by Lee in the above-referenced sections, the Lee process performs a comparison between the coding target frame f_c and the immediate past frame f_{c-1} or between the current frame f_c and the last reference frame f_{ref} .

Accordingly, when properly interpreted in light of the teachings of Lee, the sections of Lee relied upon by the Examiner directly support Applicant's position that the Type 0 threshold used in Fig. 29 is clearly just a scene change threshold and does not detect the motion between the frames as a whole.

Further, regarding the Examiner's contention on page 3 of the outstanding Office Action, that "Odaka and Lee can be cohesively applied together because they are

analogous to one another because they are both in the same MPEG video encoding environment.” Applicant respectfully submits that this is merely a conclusory statement. The Examiner has not addressed the specific arguments presented by Applicant regarding the lack of motivation and ability to combine the references as suggested by the Examiner. Applicant respectfully submits whether or not the references are analogous art is not conclusive evidence that the references are combinable as suggested by the Examiner.

As previously stated, Applicant did not allege that the Odaka and Lee references are drawn to non-analogous art. Instead Applicant clearly stated that the Examiner’s proposed combination changes the principle of operation of the Odaka patent and completely modifies the operation of the “TAMI” algorithm of the Lee reference without showing any motivation to make these modifications. As stated in MPEP § 2143.01, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959). The Examiner has failed to address the merits of this requirement and instead has merely relied on a conclusory statement that the references can be combined because they relate to an MPEG video encoding environment. Stated more simply the Examiner has failed to address why one of ordinary skill in the art would partially replace the algorithm taught in Odaka with the algorithm taught by Lee and make modifications to Lee such as eliminating the I1, I2,

P1, P2, B1, and B2 frames. Further, it is unclear how the Lee algorithm would operate without these specialized frame types.

Applicant maintains the Examiner has failed to address these deficiencies plus the additional deficiencies noted in Applicant's prior response. Further, the general allegation on page 4 of the outstanding Office Action, that taken as a whole the references suggest the claimed invention and one would be motivated to modify the references as suggested so as to accurately, effectively and efficiently encode the sequence of moving pictures, does not provide any teaching or suggestion in the prior art references. Accordingly, Applicant respectfully submits that even taken as a "whole" the teachings of these references are not sufficient to render the claims prima facie obvious, even if the alleged combination did yield Applicant's claimed combinations, which it does not. Therefore, Applicant submits that the only motivation to make such modifications to Odaka and Lee is impermissible hindsight reference to Applicant's specification.

Rejections under 35 U.S.C. § 102 and 103

Since the Examiner has maintained his rejection of claims 1-14 under 35 U.S.C. § 103 as noted above, Applicant once again traverses these rejections. Applicant expressly maintains the reasons from the prior responses to clearly indicate on the record that Applicant has not conceded any of the previous positions relative the maintained rejections. For brevity, Applicant expressly incorporates the prior arguments

presented in the October 10, 2002 response without a literal rendition of those arguments in this response.

SUMMARY

For at least the foregoing reasons and the reasons set forth in Applicant's response of October 10, 2002, it is respectfully submitted that claims 1-14 are distinguishable over the applied art.

CONCLUSION

All objections and rejections raised in the Office Action having been addressed, it is respectfully submitted that the present application is in condition for allowance and such allowance is respectfully solicited. Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.

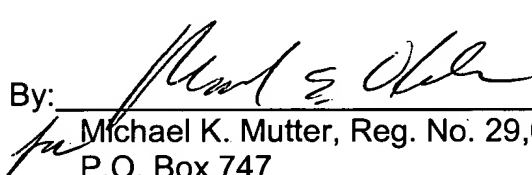
Attached hereto is a marked-up version of the changes made to the application by this Response.

Appln. No. 09/210,775

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

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Attachment: Copy of Drawing Correction Authorization Request
Copy of 1449 Form